CSCC43 Project Report

Ian Gregory
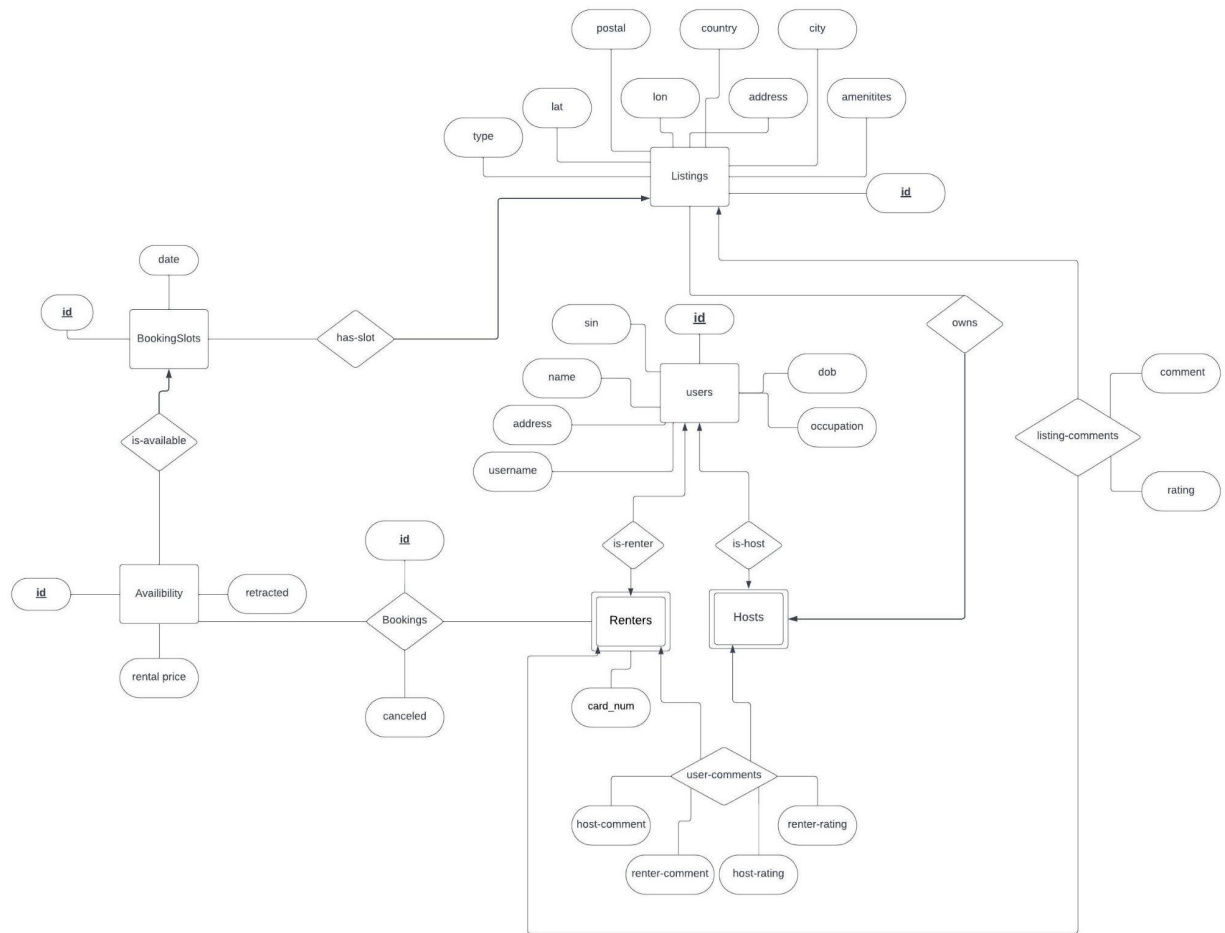Leila Cheraghi Seifabad

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Purpose

We have built MyBnB, a simple AirBnb-like web app that connects renters, who rent accommodations, with hosts, who own and maintain those accommodations. Hosts create listings in the system and schedule them as available on certain days. Meanwhile, renters can find listings using a comprehensive search system, and then book them for any available day(s). The system supports a reporting feature, allowing MyBnB corporate to dig into their performance metrics over a given time period. It also features statistical analysis for hosts, helping to price listings in accordance with the current market, and highlighting amenities correlated with other, pricier listings.

Assumptions

- Users can be both renters and hosts.
- Hosts can only comment on a renter profile within 2 weeks of the rental date
- Renters can only comment on a listing within 2 weeks of the rental date
- Users can only leave one comment for a listing or other users

ER Diagram and Schema

Relational Schema

Listings(id, country, city, postal, address, lat, lon, type, amenities)
Users(id, sin, name, username, address, dob, occupation)
Hosts(user_id)
Renters(user_id, card_num)
BookingSlots(id, date)
Availability(id, retracted, rental_price)
Bookings(id, availibility_id, canceled, renter_id)
user-comments(host_id, renter_id, host-comment, host-rating, renter-comment, renter-rating)
listing-comments(listing_id, renter_id, comment, rating)
owns(listing_id, host_id)
has-slot(slot_id, listing_id)
is-available(slot_id, availibility_id)

Schema DDL Definition

```
CREATE DATABASE IF NOT EXISTS mybnb;
USE mybnb;

CREATE TABLE Users (
  id INTEGER PRIMARY KEY AUTO_INCREMENT,

  sin INTEGER UNIQUE NOT NULL,
  username VARCHAR(63) UNIQUE NOT NULL,
  name VARCHAR(127) NOT NULL,
  dob DATE NOT NULL,
  address VARCHAR(127),
  occupation VARCHAR(31)
);

CREATE TABLE Hosts (
  user_id INTEGER PRIMARY KEY,

  FOREIGN KEY (user_id) REFERENCES Users(id) ON DELETE CASCADE
);

CREATE TABLE Renters (
  user_id INTEGER PRIMARY KEY,
  card_num CHAR(16) NOT NULL,

  FOREIGN KEY (user_id) REFERENCES Users(id) ON DELETE CASCADE
);


CREATE TABLE Listings (
  id INTEGER PRIMARY KEY AUTO_INCREMENT,
  owner_id INTEGER NOT NULL,

  country VARCHAR(31) NOT NULL,
  city VARCHAR(31) NOT NULL,
  postal CHAR(6) NOT NULL,
  address VARCHAR(127) NOT NULL,
  lat REAL NOT NULL,
  lon REAL NOT NULL,
  type VARCHAR(31) NOT NULL,
  amenities VARCHAR(255) NOT NULL,

  FOREIGN KEY (owner_id) REFERENCES Hosts(user_id) ON DELETE CASCADE
);

CREATE TABLE BookingSlots (
  id INTEGER PRIMARY KEY AUTO_INCREMENT,
  listing_id INTEGER,
  date DATE NOT NULL,

  FOREIGN KEY (listing_id) REFERENCES Listings(id) ON DELETE CASCADE,
  UNIQUE (listing_id, date)
);

CREATE TABLE Availability (
  id INTEGER PRIMARY KEY AUTO_INCREMENT,
  slot_id INTEGER,
```

```
    rental_price REAL NOT NULL,
    retracted BOOLEAN DEFAULT 0,

    FOREIGN KEY (slot_id) REFERENCES BookingSlots(id) ON DELETE CASCADE
);
CREATE VIEW AvailabilityLive AS
SELECT *
FROM Availability
WHERE NOT retracted;

CREATE TABLE Bookings (
    id INTEGER PRIMARY KEY AUTO_INCREMENT,
    availability_id INTEGER NOT NULL,
    renter_id INTEGER NOT NULL,
    cancelled BOOLEAN DEFAULT 0,

    FOREIGN KEY (availability_id) REFERENCES Availability(id) ON DELETE CASCADE,
    FOREIGN KEY (renter_id) REFERENCES Renters(user_id) ON DELETE CASCADE
);
CREATE VIEW BookingsLive AS
SELECT *
FROM Bookings
WHERE NOT cancelled;
CREATE VIEW BookingsCancelled AS
SELECT *
FROM Bookings
WHERE cancelled;

CREATE TABLE ListingComments (
    renter_id INTEGER,
    listing_id INTEGER,
    PRIMARY KEY (renter_id, listing_id),

    FOREIGN KEY (renter_id) REFERENCES Renters(user_id) ON DELETE CASCADE,
    FOREIGN KEY (listing_id) REFERENCES Listings(id) ON DELETE CASCADE,

    comment VARCHAR(511),
    rating REAL
);

CREATE TABLE UserComments (
    renter_id INTEGER,
    host_id INTEGER,
    PRIMARY KEY (renter_id, host_id),

    FOREIGN KEY (renter_id) REFERENCES Renters(user_id) ON DELETE CASCADE,
    FOREIGN KEY (host_id) REFERENCES Hosts(user_id) ON DELETE CASCADE,

    renter_comment VARCHAR(511),
    renter_rating REAL,
    host_comment VARCHAR(511),
    host_rating REAL
);
```

User Manual

Installation

1. Install Python and [Poetry](#).
2. Clone our source code: https://github.com/ThatsJustCheesy/C43-project
3. Run the commands in the README file.
4. Navigate to http://127.0.0.1:5000

Homepage

To create a new user account, click Sign Up.
To log in to an existing account, click Log In.

Sign Up

Fill the fields to create a new user account. You will then be taken to the Dashboard.

Log In

Fill the fields and click Log In. Passwords are not checked for the purposes of this demo.

Sample account usernames: host1, host2, renter1, renter2, renter3, bobby

MyBnB

Welcome to MyBnB.

[Sign Up] [Log In]

← Home

Sign Up

SIN
xxx-xxx-xxx

Name

Date of Birth
YYYY-MM-DD

Address

Occupation

Choose a Username

Choose a Password

[Sign Up]

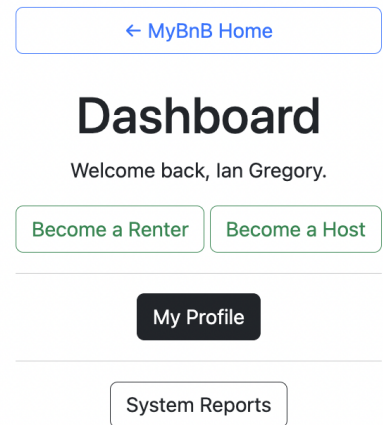
← Home

Log In

Username
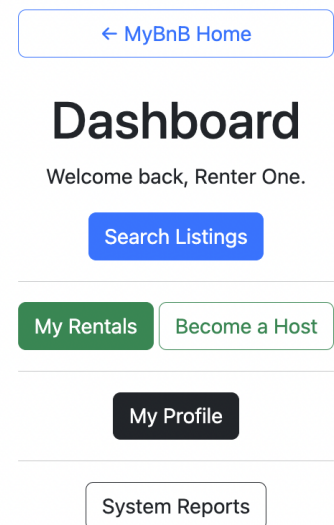
Password

[Log In]

Dashboard – Fresh Account

Each new user account starts as neither a Renter nor a Host.
To become a Renter or Host, click the appropriate button, fill the
form if applicable, and submit.

To see and update your user account information, click My Profile.
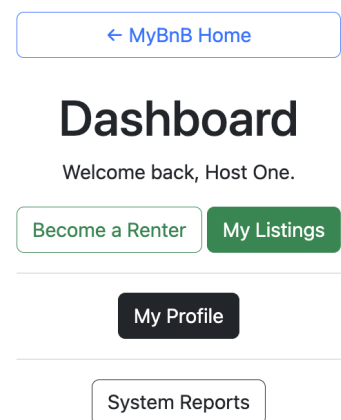To view MyBnB system reports, click System Reports.

← MyBnB Home

Dashboard

Welcome back, Ian Gregory.

Become a Renter   Become a Host

My Profile

System Reports

Dashboard – Renter

To find a listing to book, click Search Listings.
To see all your booked rentals, click My Rentals.

← MyBnB Home

Dashboard

Welcome back, Renter One.

Search Listings

My Rentals   Become a Host

My Profile

System Reports

Dashboard – Host

To view and manage your accommodation listings, click My Listings.

← MyBnB Home

Dashboard

Welcome back, Host One.

Become a Renter   My Listings

My Profile

System Reports

My Profile

Your user profile information is displayed.
To update your profile information, fill the form and click Save Changes.
To permanently delete your account, click Delete Account.

Reports

Generating a report

To generate a report for the MyBnB system, enter a start and end date, then click Generate Report.

Viewing the generated report

Once generated, the report will be shown below the form.

Bookings by City

City	Count
Licoriceville	8

Bookings by City and Postal Code

City	Postal Code	Count
Licoriceville	A1R3G0	8

Listings by Country

Country	Count
Canada	8
Candyland	4

Listing Search

Composing a query

To find listings by geographic coordinates, fill the Latitude, Longitude, and Max Distance fields.

To filter by the price for a one-night stay, fill Max Price and/or Min Price.

To sort by price (High to Low or Low to High), choose the appropriate option for Sort By Price.

To find a listing by postal code, fill Postal Code (Same and Adjacent). To ensure adjacent postal codes are found, only the first 3 characters are used for the search.

To find a listing by its address, fill Address (Exact Match). Punctuation and whitespace are significant.

To filter by availability in a given date range, fill Booking Period Start and/or Booking Period End. Listings will be restricted to those available for **at least one** of the days in the specified period.

To filter by listing type, choose an option for Type.

To look for particular amenities, choose them from the Amenities list. Hold Ctrl or Command to select multiple options.

Once satisfied with the query, click Apply Filters to view search results.

Viewing search results

Search results are displayed below the search form.

To book a displayed listing, click Book.

My Rentals

This page displays all of your current and past rental bookings.

To cancel an upcoming booking, click Cancel Rental.

To rate a host/listing corresponding to a booking you made within the last two weeks, click Rate Host/Listing, and fill the form.

← Dashboard

My Rentals

Rented by Renter One

2023-08-11 – $490/night
At the location 1000 Candy Way, Licoriceville, Candyland, A1R3G0
With Amenities Wifi, Air conditioning, Dryer, Heating, Pool, Hot tub, Gym, BBQ grill, Breakfast, Waterfront, Smoke alarm, Carbon monoxide alarm

Cancel Rental

My Past Rentals

2023-08-05 – $510/night
At the location 1000 Candy Way, Licoriceville, Candyland, A1R3G0

Rate Host | Rate Stay

2023-08-04 – $505/night
At the location 1000 Candy Way, Licoriceville, Candyland, A1R3G0

Rate Host | Rate Stay

My Listings

This page displays all of your accommodation listings.

To add a new listing to the system, click New Listing at the bottom.

To make an accommodation available to book for days in the future, click Schedule.

To edit a listing's details, such as address, type, or amenities, click Edit.

To permanently delete a listing, all of its scheduled times, and all associated bookings, click Delete.

← Dashboard

My Listings

Listed by Host One

Apartment in Toronto at M5B1G3	Schedule	Edit	Delete
Apartment in Toronto at M2P2A9	Schedule	Edit	Delete
Bed and breakfast in Winnipeg at R3L2A1	Schedule	Edit	Delete
Loft in Montréal at H3T1Y1	Schedule	Edit	Delete
Resort in Licoriceville at A1R3G0	Schedule	Edit	Delete

New Listing

Schedule Listing

A list of scheduled days for this listing is shown.

To quickly append days to the end of the schedule, click Add 7 More Days.
To add specific dates to the schedule, click Add Days…, then fill and submit the form.

Each scheduled day is in one of four states:

- *Unavailable* (red): The day is on the schedule, but no price has been set, and renters are unable to book it.
- *Available, not booked* (green): The day has a rental price set, and is available for renters to book.
- *Booked, future* (blue): The day has been booked by a renter for a future date. The booking can still be canceled by you or the renter.
- *Booked, past* (blue, under **Past Bookings**): The day was previously booked by a renter.

All listings have a blue information button. Clicking this shows specific information about the day, including its cancellation history, if any.

Unavailable

To set the price of a listing on a day, and thus make it available to be booked, click Set Price.

To remove this day from the schedule, click Delete.

Available, not booked

To change the price for a day that has not been booked (yet), click Change Price.

To retract the set price and make the listing unavailable, click Retract.

Booked, future

You have a booking; congratulations!

If you need to cancel the booking, click Cancel Booking. The day will then be available again, but you can choose to retract it, if need be.

Booked, past

To rate and/or comment on this renter, click Rate Renter, and fill the form.

Set Price

This page lets you set or change the price for a listing on a given day.
To do so, fill the form, then click Post Offer.

Set Price

2023-08-07

Apartment in Toronto at M5B1G3

Listing ID
1

Slot ID
1

Rental Price

394.55

Post Offer

Host toolkit

MyBnB's advanced statistical analysis can help you price your listing in accordance with the current market. The system's **suggested price** for your listing is based on the price for listings with amenities similar to yours. It is shown immediately below the Set Price form.

There is also a list of **Suggested amenities**. Based on other listings in the system, MyBnB will suggest amenities you may want to consider adding to your accommodation. An expected revenue increase is displayed for each, computed as the suggested price for your listing with the additional amenity minus the current suggested price for your listing.

Host Toolkit

Suggested price

Based on other listings on the market, we suggest you price this listing at:

$391.92

Computed as the mean price of other scheduled listings,
weighted by number of common amenities.

Suggested amenities

We suggest you add the following amenities to increase your revenue from this listing.

Amenity	Expected Revenue Increase
Waterfront	$5.42
BBQ grill	$3.73
Dryer	$3.72
Gym	$1.53
Hair dryer	$0.02

Expected revenue increase is computed as the suggested price **with**
the amenity, minus the current suggested price (**without** the amenity).

Edit Listing

Limitations and Next Steps for Improvement

Our implementation does not allow users to perform a keyword search, which can make finding information faster and more intuitive than a pure faceted search.

Listings should display the name of the host that owns them, as well as lead to a profile page with ratings and comments displayed. Currently, ratings and comments exist in the database, but hardly surface in the UI, save for the Noun Phrases section of the system reports.

It would be better if hosts could set the price for multiple days at once, should they want to.

When deleting users our implementation gets rid of all listings and booking associated with the account and this causes issues with the history of listings as they all get removed. It would be better if only future listings and rentals were removed and the past ones were kept.

Conceptual Problems

When designing our application we ran into an issue with deciding if users can be both hosts or renters as we would need extra conditions for our queries vs users being either a host or renter. We decided to design it such that users can be both hosts and renters as that makes it easier for users with only having to create one account.